Speed controller

MGSD type

EX type

• Features

<MGSD type>

- Internal speed changer
  Motor speed can be adjusted from the speed setting knob on the front panel.
  Not necessary to install and connect an external speed changer to the controller.
- Electric brake enables instantaneous stop.
- Compact 8P plug-in configuration.
- Variable installation options are available.
  Terminal blocks, sockets and other various options (from Panasonic Electric Works Co.,Ltd.) for panel board can be used.
- Compliant with international standards: c UL us CE

<EX type>

- Soft-start/soft-down
  Time can be adjusted up to 5 seconds.
  Excellent soft-start/soft-down linearity.
- Selectable response
  High-stable and high-response can be selected with the internal changeover switch to meet the characteristic of the application.
  (Factory setting: high-response)
- Excellent instantaneous stop capability
- Parallel operation
  Two or more motors can be controlled from a single control knob.
- Can link with various control systems
  Can control motor(s) in conjunction with different controlling systems such as sequencer. The voltage signal can also be used as control signal.

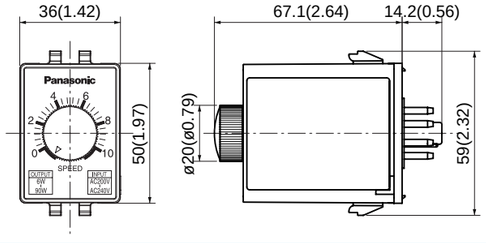
• Standard specification (MGSD type)

	MGSDA1	MGSDB1	MGSDB2
Supply voltage	Single phase 100 to 120 VAC		Single phase 200 to 240 VAC
Supply voltage tolerance	±10% (at rated voltage)		
Power frequency	50/60 Hz		
Rated input current	1.0 A	2.0 A	1.0 A
Compatible motor output	3 to 40 W	60 to 90 W	6 to 90 W
Speed control range	50Hz : 90 to 1400 r/min 60Hz : 90 to 1700 r/min		
Speed regulation (against load)	5% : 1000 r/min, Typical variation at 80% rated torque		
Speed setting	Internal		
Braking *1	Activated while electric braking current is flowing.		
Electric braking time	0.5 sec (typ.): Amount of braking current is 2 to 3 times the rated current.		
Parallel operation	Not applicable		
Product weight	80 g		

*1 Electric braking has no mechanical holding mechanism.

• Outline drawing

MGSD type



Socket is not supplied with the product. Use octal pin socket (DV0P4560), option, or Socket (AW68102) recommended by Panasonic Electric Works Co.,Ltd.

Unit: mm (inch)

* Please read your User's manual carefully so that you will understand the operation and safety precautions before attempting to operate the system.

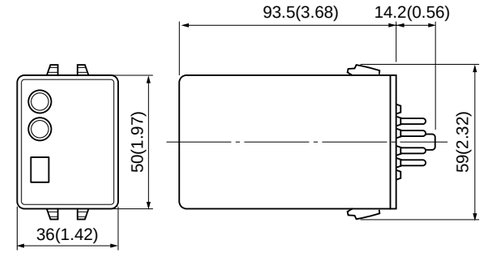
• Standard specification (EX type)

Characteristic \ Part No.	EX type				
	DV1131	**DV1132**	**DV1134**	**DV1231**	**DV1234**
Rated voltage	Single phase 100 VAC			Single phase 200 VAC	
Operating voltage range	±10% (at rated voltage)				
Power frequency	50/60 Hz				
Rated current	0.4 A	1 A	2.0 A	0.3 A	1 A
Compatible motor output *1	3 to 10 W	15 to 40 W	60 to 0 W	6 to 20 W	25 to 90 W
Operation change	High-response		High-stability		
Speed control range	90 to 1400 r/min / 90 to 1700 r/min		50 to 1400 r/min / 50 to 1700 r/min		
Speed variation	5% or more		3% or less		
Speed setting	From external controller, e.g. external speed changer *3				
Braking*2	Active while electric braking current is flowing.				
Electric braking time	5 sec typ. The braking current will be turned off before the 5-sceond limit as the motor stops. (Braking current is 2 to 3 times the rated current.)				
Parallel operation	Enabled				
Soft-start/soft-down capability	Available (typically up to 5 sec (0 to max. speed))				
Operating temperature range	–10 to 50˚C				
Storage temperature	–20 to 60˚C				

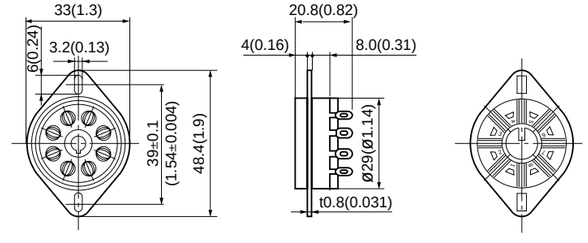
*1 Applicable to Panasonic compact speed variable geared motors. Select motors with applicable output.
*2 Electric braking has no mechanical brake holding mechanism.
To provide brake holding, use our C&B motor or variable speed motor containing electromagnetic brake.
When braking a load having excessively high inertia, durability and life expectancy of motor shaft and gear should be taken into consideration. Use the motor within the allowable inertia.
*3 EX type is supplied with the external speed changer.

• Outline drawing

EX type



Socket (accessory)



Unit: mm (inch)

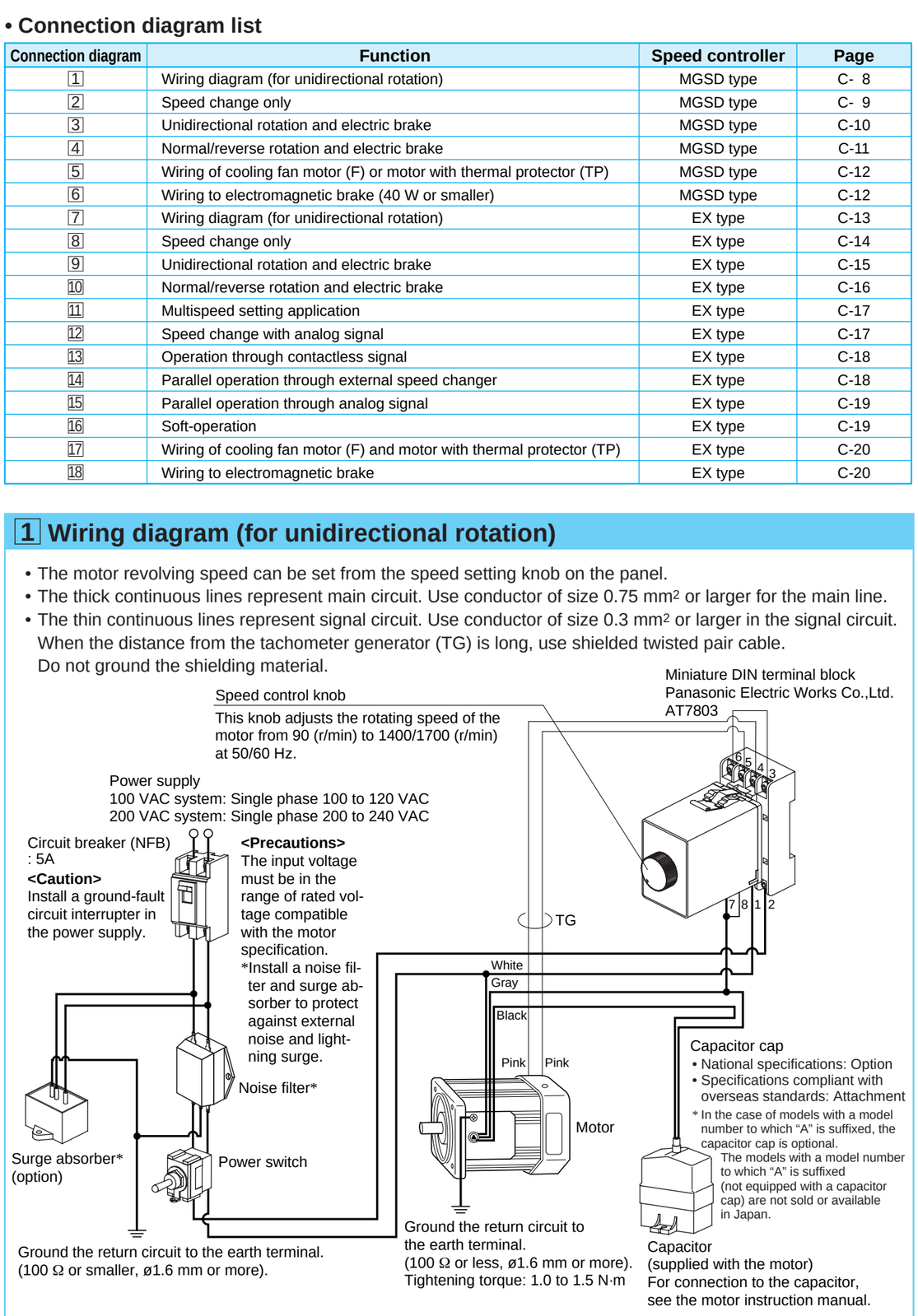
* Please read your User's manual carefully so that you will understand the operation and safety precautions before attempting to operate the system.

• Connection diagram list

Connection diagram	Function	Speed controller	Page
1	Wiring diagram (for unidirectional rotation)	MGSD type	C- 8
2	Speed change only	MGSD type	C- 9
3	Unidirectional rotation and electric brake	MGSD type	C-10
4	Normal/reverse rotation and electric brake	MGSD type	C-11
5	Wiring of cooling fan motor (F) or motor with thermal protector (TP)	MGSD type	C-12
6	Wiring to electromagnetic brake (40 W or smaller)	MGSD type	C-12
7	Wiring diagram (for unidirectional rotation)	EX type	C-13
8	Speed change only	EX type	C-14
9	Unidirectional rotation and electric brake	EX type	C-15
10	Normal/reverse rotation and electric brake	EX type	C-16
11	Multispeed setting application	EX type	C-17
12	Speed change with analog signal	EX type	C-17
13	Operation through contactless signal	EX type	C-18
14	Parallel operation through external speed changer	EX type	C-18
15	Parallel operation through analog signal	EX type	C-19
16	Soft-operation	EX type	C-19
17	Wiring of cooling fan motor (F) and motor with thermal protector (TP)	EX type	C-20
18	Wiring to electromagnetic brake	EX type	C-20

1 Wiring diagram (for unidirectional rotation)

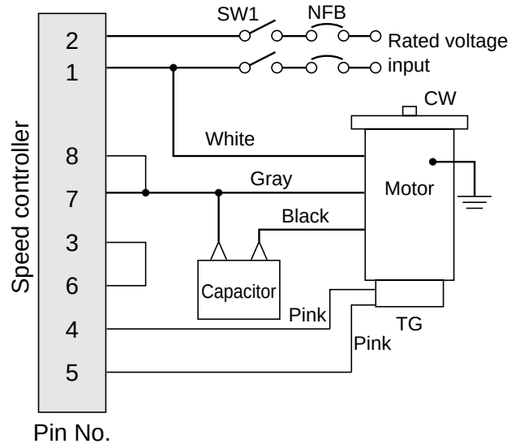
- The motor revolving speed can be set from the speed setting knob on the panel.
- The thick continuous lines represent main circuit. Use conductor of size 0.75 mm² or larger for the main line.
- The thin continuous lines represent signal circuit. Use conductor of size 0.3 mm² or larger in the signal circuit. When the distance from the tachometer generator (TG) is long, use shielded twisted pair cable. Do not ground the shielding material.


Miniature DIN terminal block
Panasonic Electric Works Co.,Ltd.
AT7803
Speed control knob
This knob adjusts the rotating speed of the motor from 90 (r/min) to 1400/1700 (r/min) at 50/60 Hz.
Power supply
100 VAC system: Single phase 100 to 120 VAC
200 VAC system: Single phase 200 to 240 VAC
Circuit breaker (NFB) : 5A
<Caution>
Install a ground-fault circuit interrupter in the power supply.
<Precautions>
The input voltage must be in the range of rated voltage compatible with the motor specification.
*Install a noise filter and surge absorber to protect against external noise and lightning surge.
TG
White
Gray
Black
Pink
Pink
Noise filter*
Surge absorber* (option)
Power switch
Motor
Capacitor cap
• National specifications: Option
• Specifications compliant with overseas standards: Attachment
* In the case of models with a model number to which “A” is suffixed, the capacitor cap is optional. The models with a model number to which “A” is suffixed (not equipped with a capacitor cap) are not sold or available in Japan.
Ground the return circuit to the earth terminal.
(100 Ω or smaller, ø1.6 mm or more).
Ground the return circuit to the earth terminal.
(100 Ω or less, ø1.6 mm or more).
Tightening torque: 1.0 to 1.5 N·m
Capacitor
(supplied with the motor)
For connection to the capacitor, see the motor instruction manual.

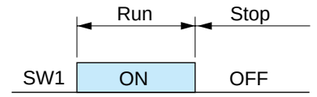
* Please read your User's manual carefully so that you will understand the operation and safety precautions before attempting to operate the system.

2 Speed change only

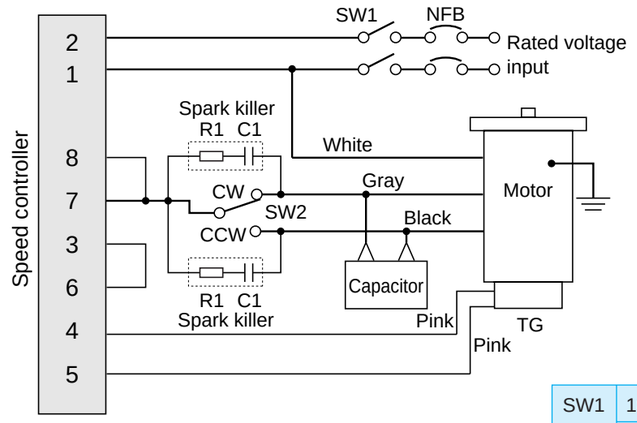
Unidirectional rotation

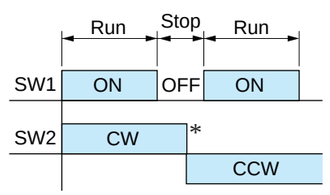


Rotating direction viewed from shaft end	
CW	Clockwise
CCW	Counterclockwise



Normal/reverse rotation





SW1 : Power switch
SW2 : Normal/reverse selector switch

SW1	100 V supply system	5 A or more at 125 VAC
SW2	200 V supply system	5 A or more at 250 VAC
Spark killer R1+C1		DV0P008 (option)

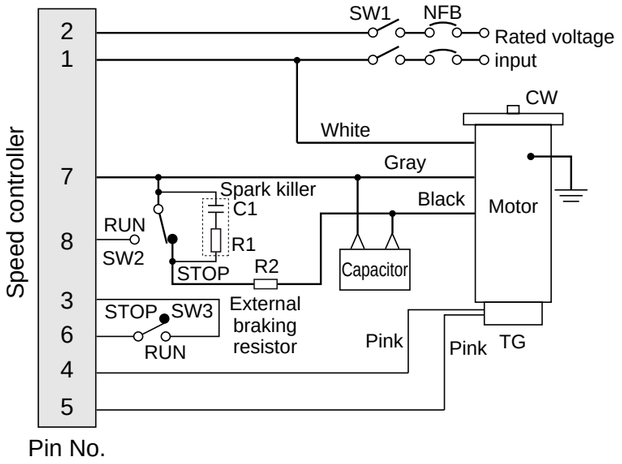
<Precautions>

1. To change rotating direction of induction motor:
   Provide a motor halt period. Switch over SW2 after complete stop of the motor.
2. To change rotating direction of reversible motor:
   A motor halt period is not necessary. Switch over SW2 while keeping SW1 turned ON. When configuring SW2 with relay contacts, use a relay having large gap between contacts (e.g. HG/HP relay from Panasonic Electric Works Co.,Ltd.) to prevent malfunction due to short-circuited capacitor.
3. For motors for cooling fan and motors with thermal protector, also refer to page C-12.
4. When using independent relay contacts for SW2 to change over normal/reverse, interlock both contacts so that they will not close simultaneously.
5. The spark killer consisting of R1 and C1 must be used to protect the relay contacts.

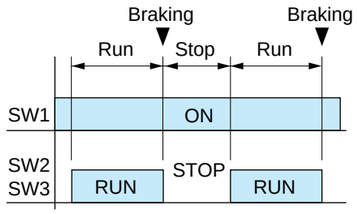
* Please read your User's manual carefully so that you will understand the operation and safety precautions before attempting to operate the system.

3 Unidirectional rotation and electric brake

25 W or smaller

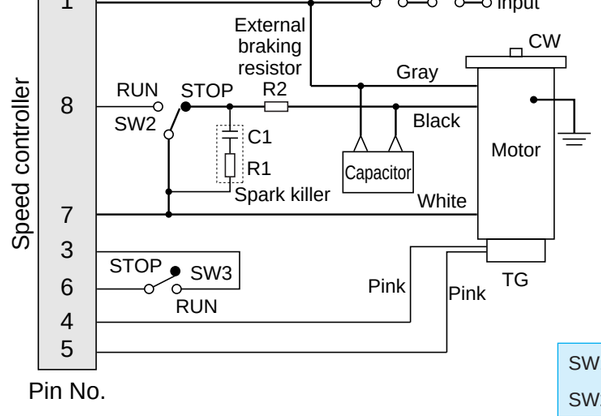


- Connection according to this wiring diagram causes the motor to rotate clockwise when viewed from the motor shaft end. To run the motor counterclockwise, interchange the connecting point of black and gray leads.



SW1 : Power switch
SW2 : RUN/STOP switch
SW3 : Brake start switch

40 W or larger



SW1	100 V supply system	5 A or more at 125 VAC
SW2	200 V supply system	5 A or more at 250 VAC
SW3		DC10 V 10 mA
Spark killer R1+C1		DV0P008 (option)
External braking resistor R2		DV0P003 (option)

<Precautions>

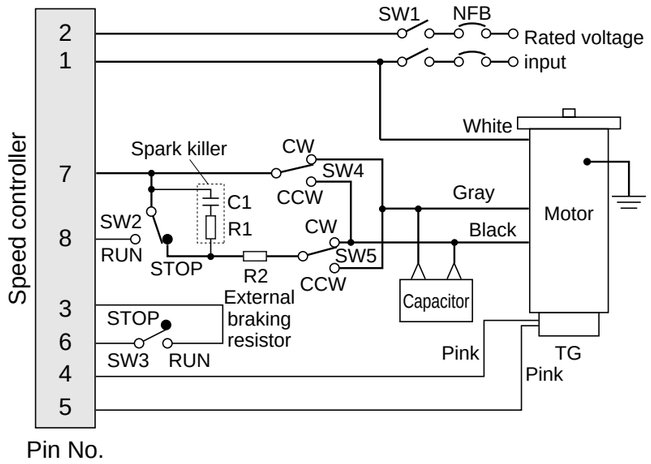
1. When SW2 and SW3 are switched from RUN to STOP, electric braking is applied for approx. 0.5 sec, and the motor stops instantly.
   Difference in switching time between SW2 and SW3 must be 0.1 sec or shorter. If SW2 (SW3) is in RUN position while SW3 (SW2) is in STOP, abnormal operation occurs (full speed rotation for a short time) and motor temperature rises excessively.
2. The number of start/stop operations must be 6/min. or less.
3. For motors for cooling fan and motors with thermal protector, also refer to page C-12.
4. The spark killer consisting of R1 and C1 must be used to protect the relay contacts.
5. R2 limits flow of discharging current upon short-circuiting of the capacitor during braking.

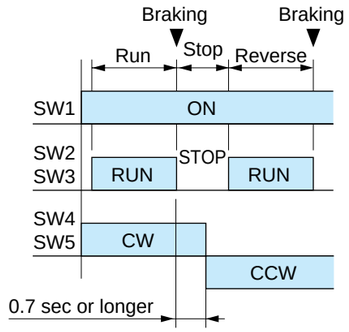
* Please read your User's manual carefully so that you will understand the operation and safety precautions before attempting to operate the system.

4 Normal/reverse rotation and electric brake

25 W or smaller

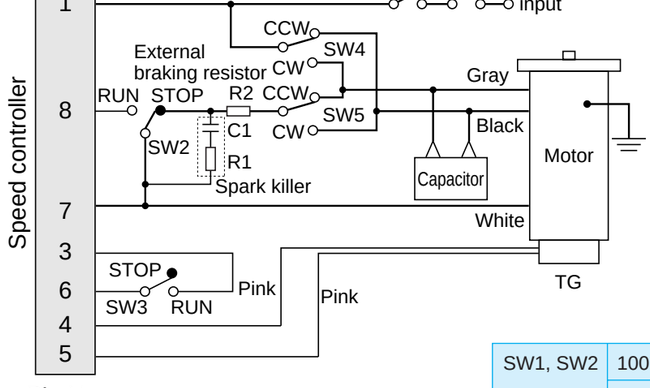
Rotating direction viewed from shaft end	
CW	Clockwise
CCW	Counterclockwise





SW1 : Power switch
SW2 : RUN/STOP switch
SW3 : Braking start switch
SW4 : Normal/reverse selector switch

40 W or larger



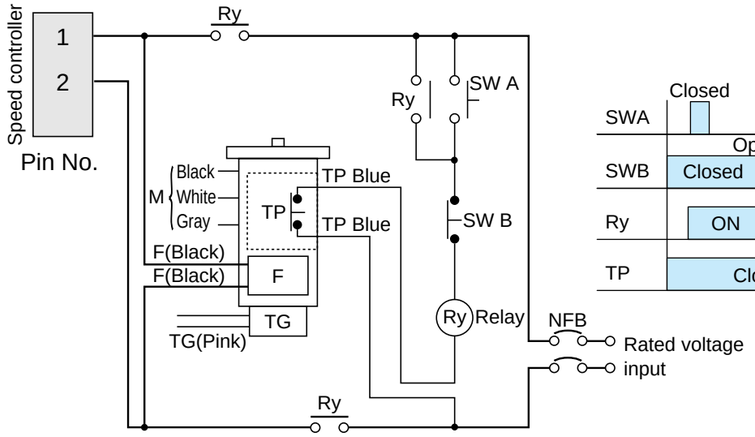
SW1, SW2	100 V supply system	5 A or more at 125 VAC
SW4, SW5	200 V supply system	5 A or more at 250 VAC
SW3		DC10 V 10m A
Spark killer R1+C1		DV0P008 (option)
External braking resistor R2		DV0P003 (option)

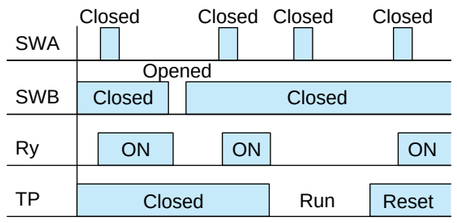
<Precautions>

1. When SW2 and SW3 are switched from RUN to STOP, electric braking is applied for approx. 0.5 sec, and the motor stops instantly. (Do not operate SW4 and SW5 until the motor stops.)
   Difference in switching time between SW2 and SW3 must be 0.1 sec or smaller. If SW2 (SW3) is in RUN position while SW3 (SW2) is in STOP, abnormal operation occurs (full speed rotation for a short time) and motor temperature rises excessively.
2. Do not change the motor rotating direction (SW4, SW5) while the motor is running.
3. The number of start/stop operations must be 6/min. or less.
4. For motors for cooling fan and motors with thermal protector, also refer to page C-12.
5. The spark killer consisting of R1 and C1 must be used to protect the relay contacts.

* Please read your User's manual carefully so that you will understand the operation and safety precautions before attempting to operate the system.

5 Wiring of cooling fan motor (F) or motor with thermal protector (TP)





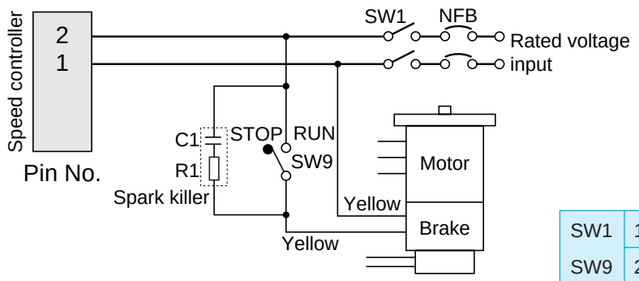
SW A		Momentary N.O. contact
SW B		Momentary N.C. contact
Relay Ry	100 V supply system	125 VAC 5 A or more 3a contact
	200 V supply system	250 VAC 5 A or more 3a contact

<Precautions>

1. The thermal protector (TP) is an automatic reset type. To prevent hazards caused by restarting, connect the TP as shown above. Don't connect TP directly to the power supply.
2. Once the TP operates, cooling period is required before the operation can restart.
3. Connect the cooling fan motor (F) across pins 1 and 2 on the power terminal.
4. Motor (M) and tachometer generator (TG) should be connected according to corresponding wiring diagram shown later.

6 Wiring to electromagnetic brake (40 W or smaller)

• Variable speed motor with electromagnetic brake should be wired as shown below.



SW1	100 V supply system	5 A or more at 125 VAC
SW9	200 V supply system	5 A or more at 250 VAC
Spark killer R1+C1		DV0P008 (option)

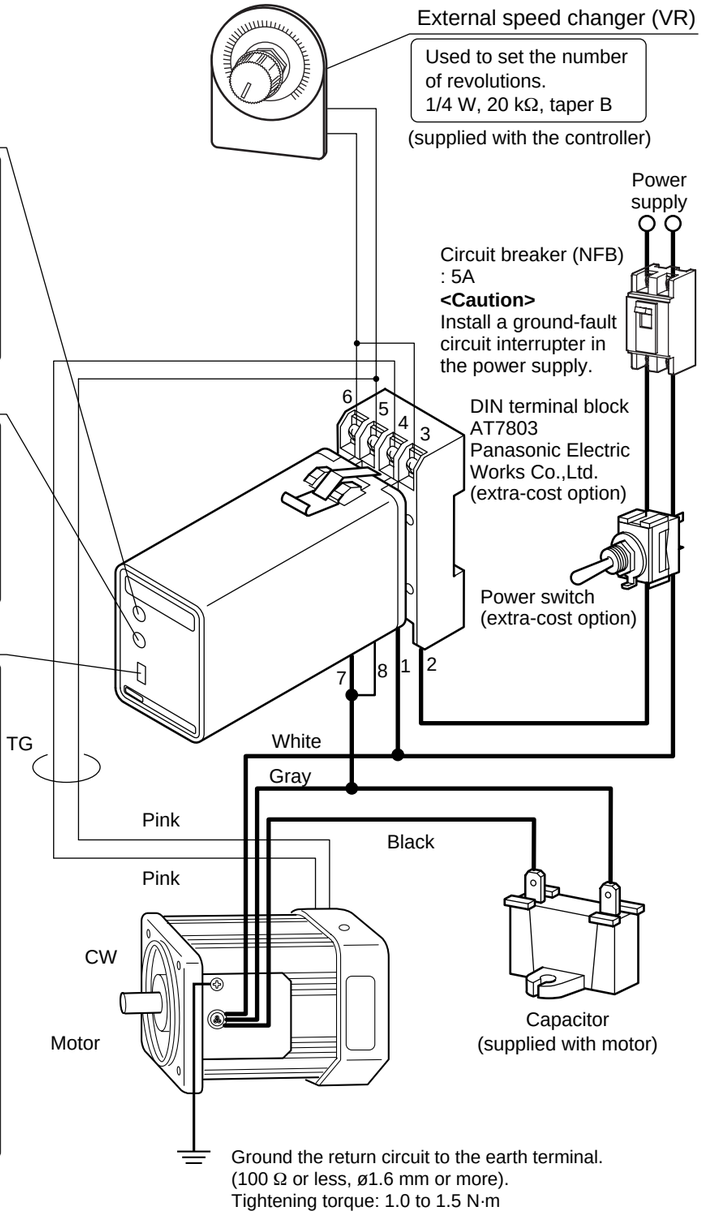
<Precautions>

1. Operate SW9 simultaneously with RUN/STOP switching of other switches, if any. Placing other switch to RUN position while the brake is active (SW9 at STOP position) causes the motor to generate heat.
2. For remaining wirings, refer to corresponding wiring diagram.

* Please read your User's manual carefully so that you will understand the operation and safety precautions before attempting to operate the system.

7 Wiring diagram (for unidirectional rotation)

- The thick continuous lines represent main circuit. Use conductor of size 0.75 mm² or larger for the main line.
- The thin continuous lines represent signal circuit. Use conductor of size 0.3 mm² or larger in the signal circuit. When the distance from the tachometer generator (TG) is long, use shielded twisted pair cable.



• Soft-start/down control

Soft-start and soft-down times can be adjusted by a single setting.
Use this feature to protect the load from shock caused by sharp speed change at startup and shutdown of the motor.
To disable the soft operation, turn the control fully clockwise.

• Maximum speed control

Use this control to adjust the revolving speed when the external speed changer is set at the top speed.
Adjust the speed to 1400 (r/min) or below at 50 Hz; or 1700 (r/min) or below at 60 Hz.

• Operation changeover switch

Select "high-stable" or "high-response":

<High-stable>

- Keeps the rotation speed variation low against variation in load.
- Enables a wide range of speed control.
- Suitable for capability control.
- May fail to maintain constant rotation speed upon sharp load change.

<High-response>

- Enables quick response with low hunting.
- Suitable for positioning application.
- May fail to keep rotation speed variation low against variation in load.
- Not suitable for controlling wide range of speed.

* Please read your User's manual carefully so that you will understand the operation and safety precautions before attempting to operate the system.